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Key R&T Issues

- Identify key research and technology issues of both near-term (now to 2010) and far-term (beyond 2010) impact.
  - Need for Communication Application Research Facility
  - Need for flexible communication pipes and self-organizing software that interface transparently to Internet based approach
  - Security, quality of service control, addressability (IPv6)
  - Integration of VDL Mode 3 (NEXCOM) with Airborne Internet (Common implementation of all NAS users)
  - Identify other comm standards that should be applied for eventual certification.
  - There may be a need for a common radio application for interoperability.
  - Alternative approach is a multi-mode radio or software configurable radio.
  - Long term research into better VHF bandwidth utilization.
  - Surveillance Application Availability for non-radar areas near GA airports
  - ADS-B
  - Multilateration Systems
  - Nav: Backup position determination using range measurement off communication signal, as backup for GPS.

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Current Work

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- Identify known work being done to address R&T issues in the topical area being discussed, and organizations doing the work.
  - Airborne Internet, ITP addressable, multi-mode radio work being done by PMEI, CNS Inc, Microflight.
  - ARINC Comm solutions
  - UPS UAT Comm system
  - Honeywell & ARNAV data link systems
  - C-Band radio, by Southeast SATSlab for wide band use.
  - IPv 6, by IEEE (ARINC considering participation)

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Unaddressed Issues

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- Identify issues not being addressed by any known R&T effort, as well as areas where current work is inadequate or underfunded.
  - Long term research into improved utilization of VHF spectrum, such as antenna polarization, spread spectrum, beam-forming.
  - Security Authentication
  - Research on IPv6

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Priorities

- Prioritize the key R&T issues needing attention.
  - Applications Research Facility Implementation
  - Airborne Internet Architecture Consensus (Guidelines, Standards, Certification methods)
  - Integration of VDL Mode 3 (NEXCOM) with Airborne Internet (Common implementation of all NAS users)
  - Better utilization of the aviation spectrum (lessons learned from cellular).
  - IPv6

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Recommended Approach

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- Recommend approaches to address the key R&T needs, organizations which might address these needs, needed collaborations or cooperative efforts, etc.
  - Integration for Comm should be a network-centered system.
  - Develop technology applications that are dual or multimode to handle the variety of users transparently.
  - Continue AI research.
  - Explore different radio options including freq modulation techniques, etc.
  - Nav: Explore position determination using range measurement off communication signal, as backup for GPS. By NASA.
  - NAV: Explore differential position updates over the Airborne Internet without having a differential unit on the airfield (shared GPS Dif unit covering a community of airfields) – perhaps avoiding the need for WAAS or LAAS receivers. May improve continuity of service.
  - Surveillance: Explore transfer of GPS position over the Airborne Internet without needing a transponder for radar-like position reporting. Issue is mixed equipage and non-cooperative aircraft.